HERPETOLOGY.—*A new subspecies of the teiid lizard* Cnemidophorus sexlineatus (*Linnaeus*) *from eastern United States.* Richard L. Hoffman, Blacksburg, Va.

(Received March 25, 1957)

Thirteen years ago, in 1944, I published a short note concerning the occurrence of *Cnemidophorus sexlineatus* in western Virginia, mentioning that the parietal plates of the specimens examined were divided into several smaller scales. Somewhat later I studied series of racerunners from various places along the Atlantic Coast, and observed a geographic trend in number of parietals, increasing from south to north and reaching a culmination in Maryland and Virginia, whence came specimens having as many as 11 scales in the parietal group. These findings appeared in 1950, in a brief paper which sought to minimize the significance of this variation by endeavoring to explain it in terms of an uninterrupted geographic gradient.

The presentation of my data was made upon a purely latitudinal basis, and involved only the average parietal counts grouped according to the states from which material had been seen. Such an interpretation made no allowance for the evaluation of local populations or any correlation of variability with physiography, and was subsequently challenged (*in litt.*) by Hobart Smith and M. B. Mittleman. I have accordingly adopted a somewhat different arrangement of the data, from which it appears, as suggested by my two colleagues, that a taxonomically recognizable population of the racerunner occurs in Virginia and Maryland, and may be distinguished from the bulk of the *sexlineatus* population by two characters capable of expression in quantative terms.

The character of the parietals, although of unquestionable value, is difficult to treat with precision. In many cases it is almost impossible to say whether a scale is part of the original parietal or merely one of the normal small adjacent plates, and probably no two persons would make the counts in exactly the same way. There is, however, a fortunate correlation in the number of femoral pores, a feature which lends itself well to objective presentation. Reduction in the number of pores is coincident with the fission of the parietals to the extent of being quite useful for diagnostic purposes.

For the present study I have examined a total of 200 specimens from all parts of the range of the species. An effort was made to utilize all of the readily available material from Virginia and Maryland, with several large series from other areas along the Atlantic coast and representative samples of variable size from midwestern localities. The majority of the specimens seen are in the collection of the U. S. National Museum (USNM) and were made available through the characteristic kindness of Dr. Doris M. Cochran. I am further grateful to M. Graham Netting for the opportunity of studying material in the Carnegie Museum (CM); to Dr. Albert Schwartz for the loan of the racerunners of the Charleston Museum (CHM); to James A. Fowler for access to specimens in his private collection (JAF); and to John B. Funderberg for providing a valuable series of specimens from eastern North Carolina.

The population inhabiting central North Carolina, Virginia, and southern Maryland may be recognized, with reference to the reduced femoral pore series, by the name—

Cnemidophorus sexlineatus oligoporus, n. subsp.

Type specimens.—Holotype, USNM. no. 135232, adult male, collected at Griffith, 6 miles east of Clifton Forge, Alleghany County, Va., on May 30, 1953. Allotype, USNM no. 135233, adult female, with same data. Paratypes are indicated in the list of specimens examined.

Diagnosis.—A race of *Cnemidophorus sexlineatus* characterized by a tendency of the parietal plates to divide into a number of small scales, usually 5 or more, and by a corresponding reduction in number of femoral pores, 30 or less in 85 percent of 50 specimens referred to this subspecies on the basis of parietal count and/or geographic provenance, as opposed to 31 or more in 81 percent of 78 specimens of *sexlineatus*.

Range.—From the vicinity of Baltimore, Md.,

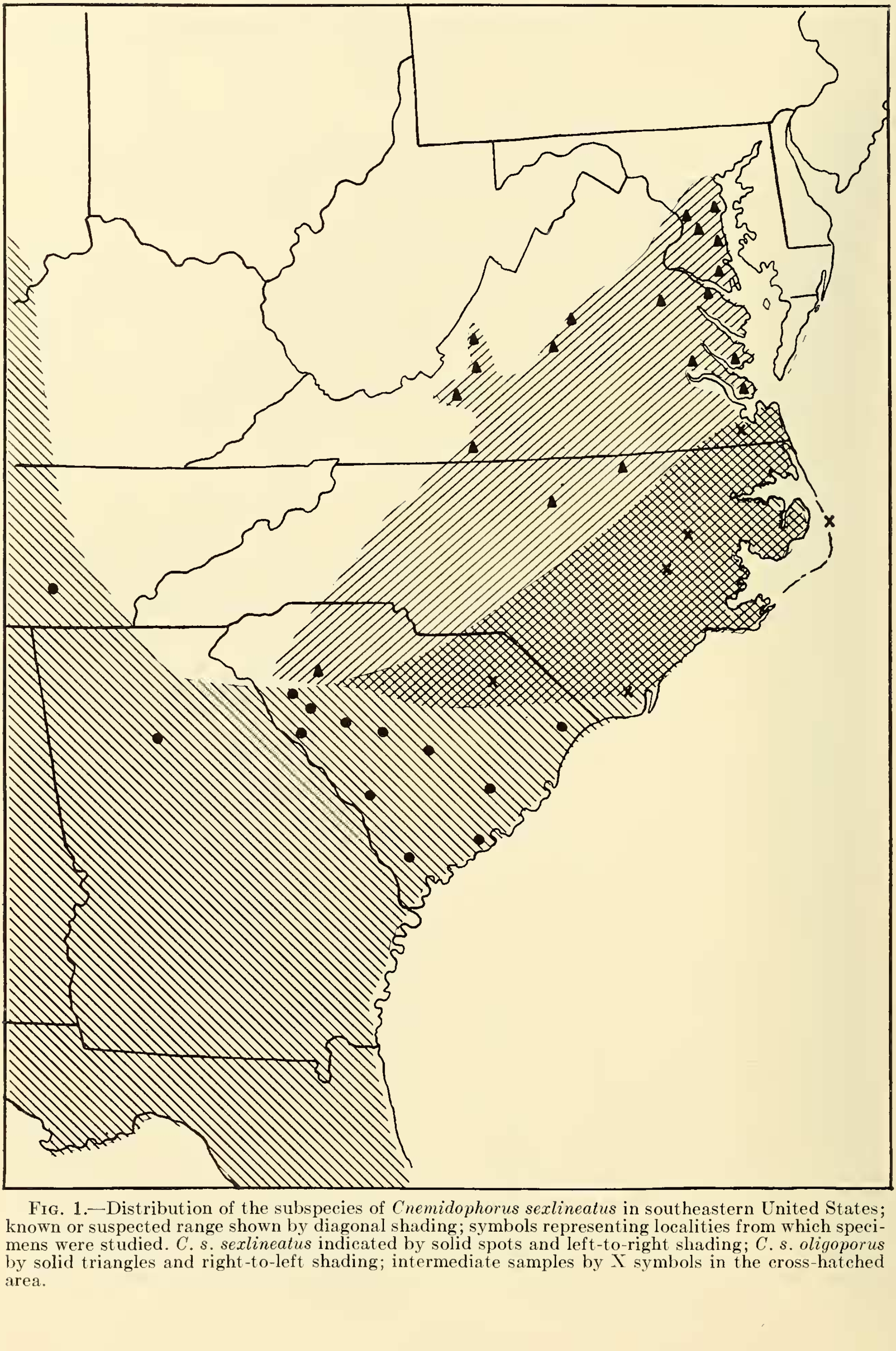

FIG. 1.—Distribution of the subspecies of *Cnemidophorus sexlineatus* in southeastern United States; known or suspected range shown by diagonal shading; symbols representing localities from which specimens were studied. *C. s. sexlineatus* indicated by solid spots and left-to-right shading; *C. s. oligoporus* by solid triangles and right-to-left shading; intermediate samples by X symbols in the cross-hatched area.

south to extreme southeastern Virginia, thence southwest in the Piedmont to Laurens County, S. C. Intergradation with *C. s. sexlineatus* takes place throughout most of the Coastal Plain in North Carolina and along the Fall Line in South Carolina. In Virginia, *C. s. oligoporus* penetrates into the Ridge and Valley Province along the valleys of the James and Roanoke Rivers.

Intergradation.—The status of certain samples has been determined, somewhat empirically, by the following principle: considering the interval between 30 and 31 femoral pores as the break which gives the best separation of specimens on the basis of their geographic provenance, any series of five or more individuals in which the percentage of segregation was more nearly equal than the ratio 70:30 has been regarded as representing an intergrade population. Such data, fitted to a map, provide a fairly accurate delineation of the distribution of this variable. Table 1 presents selected instances of different populations sampled. When single specimens, or small series only, were available, they were determined on the basis of pores, parietal count, place of origin, or a combination of all three.

TABLE 1.—PERCENTAGE SEPARATION OF SPECIMENS FROM VARIOUS LOCALITIES ON THE BASIS OF 30 OR LESS *vs.* 31 OR MORE FEMORAL PORES

Locality and number of specimens	Percentage separation
Southern Maryland (18)	72
Caroline County, Va. (4)	75
Western Virginia (8)	100
Central Virginia (4)	100
New Kent County, Va. (14)	92
Eastern North Carolina (26)	59
Piedmont South Carolina (5)	80
Eastern South Carolina (14)	72
Gwinnett County, Ga. (4)	75
Brevard County, Fla. (10)	90
Florida Keys (10)	80
Central Mississippi (8)	88
Central Tennessee (7)	72
Missouri (7)	86

It is important to observe that there is no evidently consistent continuation of either increase or decrease of femoral pore count in either direction away from the area of intergradation, resulting in a fairly abrupt break between the two subspecies. *C. s. oligoporus* is apparently a product of terminal raciation, and occupies a rather small area in comparison to the total range of the species.

The actual extent of the intermediate population is probably not much different from that as presently known and mapped, although much can yet be done in the way of refinement by analysis of local series from the central parts of North and South Carolina. Of particular value would be a study of the racerunners of western South Carolina and adjacent northwest Georgia, to substantiate or discredit my somewhat tentative allocation of three specimens from Laurens County, South Carolina, to *oligoporus*. Numerous small series from counties on and adjacent to the Fall Line in South Carolina appear to be *C. s. sexlineatus*, with a tendency toward intergrades with *oligoporus*. A small series from northern Georgia (Gwinnett County) is typical of *sexlineatus* in every respect.

The racerunners in the vicinity of Charleston, S. C., which may be considered topotypical *sexlineatus*, appear to be at the edge of the intergrade area, and somewhat affected by a reduction in pore counts. Thus, of 14 specimens from Charleston and adjoining counties, 4 (28 percent) have less than 31 pores and only 10 (72 percent) are referable to *sexlineatus* as here diagnosed. However, the frequency distribution of the available data is skewed sufficiently to the high side to indicate that additional counts would probably create a higher percentage of separation than is now apparent. At the same time, there are enough lower figures from the Charleston region to justify relegation of Merrem's name *fallax* (based on a specimen with 30 pores) to the synonymy of *sexlineatus*.

SPECIMENS EXAMINED

Cnemidophorus sexlineatus oligoporus (63):

MARYLAND. Ann Arundel County: Priest's Bridge, USNM 1; Davidsonville, USNM 1. Calvert County: Cove Point, JAF 4; Chesapeake Beach USNM 2; locality not known, USNM 1. Prince Georges County: Beltsville, USNM 2. St. Marys County: Point Lookout, USNM 6; Piney Point, USNM 2.

DISTRICT OF COLUMBIA: Terra Cotta, USNM 2, JAF 1.

VIRGINIA. Albemarle County: Charlottesville, USNM 3. Alleghany County: Clifton Forge and vicinity, USNM 6 (*paratypes*); Covington, USNM 1 (*paratype*). Botetourt County: Eagle Rock, USNM 1 (*paratype*). Caroline County: Chilesburg, USNM 4. Elizabeth City County: Hampton, USNM 1. Gloucester County: Gloucester Point, USNM 1. Henry County: Spencer, CM 2. Nelson County: Midway Mills, CM 1 (*paratype*). New Kent County: Lanexa, CM 13. Roanoke County:

Roanoke, USNM 1. Westmoreland County: near Hague, USNM 1.

North Carolina. Durham County: Durham, USNM 3. Warren County: USNM 1.

South Carolina. Laurens County, USNM 3. Intergrades, *oligoporus* × *sexlineatus* (35):

Virginia. Nansemond County: Suffolk, USNM 1.

North Carolina: Brunswick Co.: 5 miles north of Southport, USNM 2. Dare County: Hatteras Island, USNM 3. Lenoir County: Kinston, USNM 17. Pitt County: Greenville, USNM 11.

South Carolina. Darlington County: Darlington, CHM 2.

Specimens regarded as typical of *C. s. sexlineatus* have been examined from the following counties in South Carolina: Barnwell, Berkeley, Calhoun, Charleston, Greenwood, Horry, Jasper, Kershaw, Lexington, McCormick, Saluda, and Sumter, with a total of 25 specimens.

To determine whether the characters of *oligoporus* recur at other parts of the species' range, samples were checked as indicated from the following States: Georgia (4), Florida (27), Mississippi (12), Tennessee (3); Louisiana (5), Kentucky (2), Missouri (8), Kansas (10), Nebraska (2), and Wisconsin (2). In the majority of these specimens there is little or no overlap in parietal or femoral pore counts upon those diagnostic of the northeastern subspecies. However, one other geographically variable character was discovered, the degree of separation of the 3rd supraocular from the adjacent frontoparietal by a row of small intercalary scales. In *C. s. oligoporus*, there are normally two or three such scales between the 3rd supraocular and the frontoparietal, so that those two plates are nearly or entirely separated from each other. In the Midwest, however, they are either completely in contact, or separated only for a very short distance by a single intercalary scale. Unfortunately, the distribution of this interesting character does not coincide with that of the parietal and pore formulas, as it was found that Floridian racerunners were identical with those from Maryland in this respect, and presumably the transition into the western form takes place in Georgia or Alabama. It is, nonetheless, indicative of the various adaptive necessities imposed upon the species during its occupancy of the damper, forested habitat of the Atlantic Coastal region. One is tempted to speculate that the reduction of the femoral pore series reflects slightly shorter legs, perhaps influenced by residence in semiwooded areas where open ground was quite limited and the necessity for long sprints to shelter less frequent or imperative.

In western Virginia, *oligoporus* is not uncommon in its favorite habitats: railroad embankments, sandy river floodplains, and open shale barrens. These three conditions are combined at the type locality, and a dozen or more lizards can easily be seen during a short walk along the railway. The structural similarity of the montane population to that of lowland Virginia and Maryland confirms my earlier surmise that its members are migrants, rather than relicts. The valleys of the James and Roanoke Rivers offer fairly level avenues of access into the Alleghanies, and the extensive shale barrens of central western Virginia provide abundant habitat for lizards with a preference for open, semiarid areas.

REFERENCES

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The annihilation of matter is unthinkable for the same reason that the creation of matter is unthinkable, the reason namely that nothing cannot be an object of thought.—H. Spencer.